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ELECTRON PRODUCTION ELECTRON ATTACHMENT AND CHARGE
RECOMBINATION PROCESS I . (U) SAN DIEGO STATE UNIV CA

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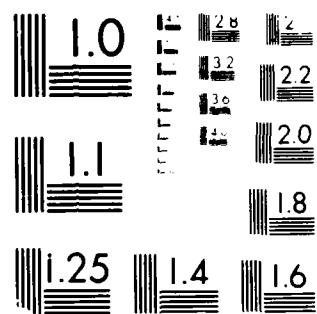
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MICROCOPY RESOLUTION TEST CHART
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19. ABSTRACT (Continue on reverse if necessary and identify by block number) <p>A mass spectrometer system has been purchased by this grant. The purchased equipment were used to construct an apparatus as shown in Fig. 1. This apparatus includes a quadrupole mass analyzer, ion detectors, high vacuum pump system, a vacuum chamber, electronics and power supplies, as well as optical multichannel analyzer and excimer laser. This apparatus is being used to analyze the positive and negative ions produced in electrical discharges. The transient chemical species in electrical discharges (such as radicals and excited ions) are also being investigated using this apparatus. The information obtained from this research are useful for the understanding of discharge mechanisms.</p> <p><i>(Keywords):</i> _____</p>												
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November 20, 1987

**Final Report for Grant No. AFOSR-87-0059
University Research Instrumentation Program
Covering the period from October 1, 1986 to September 30, 1987**

**Instruments Acquired for Supporting the Research Entitled;
ELECTRON PRODUCTION, ELECTRON ATTACHMENT AND CHARGE
RECOMBINATION PROCESS IN HIGH PRESSURE GAS DISCHARGES**

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This report covers the period from October 1, 1986 to September 30, 1987 for the Grant No. AFOSR-87-0059 supported by the University Research Instrumentation Program. A mass spectrometer system has been purchased by this Grant. The equipment is mainly used to support the research program currently sponsored by the Air Force Office of Scientific Research under Grant No. AFOSR-86-0205. This equipment will also enhance the research capability for the project currently supported by the SDIO/IST managed by ONR under Grant No. N00014-86-K-0558. The manufacturer and costs as well as the uses of the equipment are listed in the attached Schedule 1.

The purchased equipment were used to construct an apparatus as shown in Fig. 1. This apparatus includes a quadrupole mass analyzer, ion detectors, high vacuum pump system, a vacuum chamber, electronics and power supplies, as well as optical multichannel analyzer and excimer laser. This apparatus is being used to analyze the positive and negative ions produced in electrical discharges. The transient chemical species in electrical discharges (such as radicals and excited ions) are also being investigated using this apparatus. The information obtained from this research are useful for the understanding of discharge mechanisms.

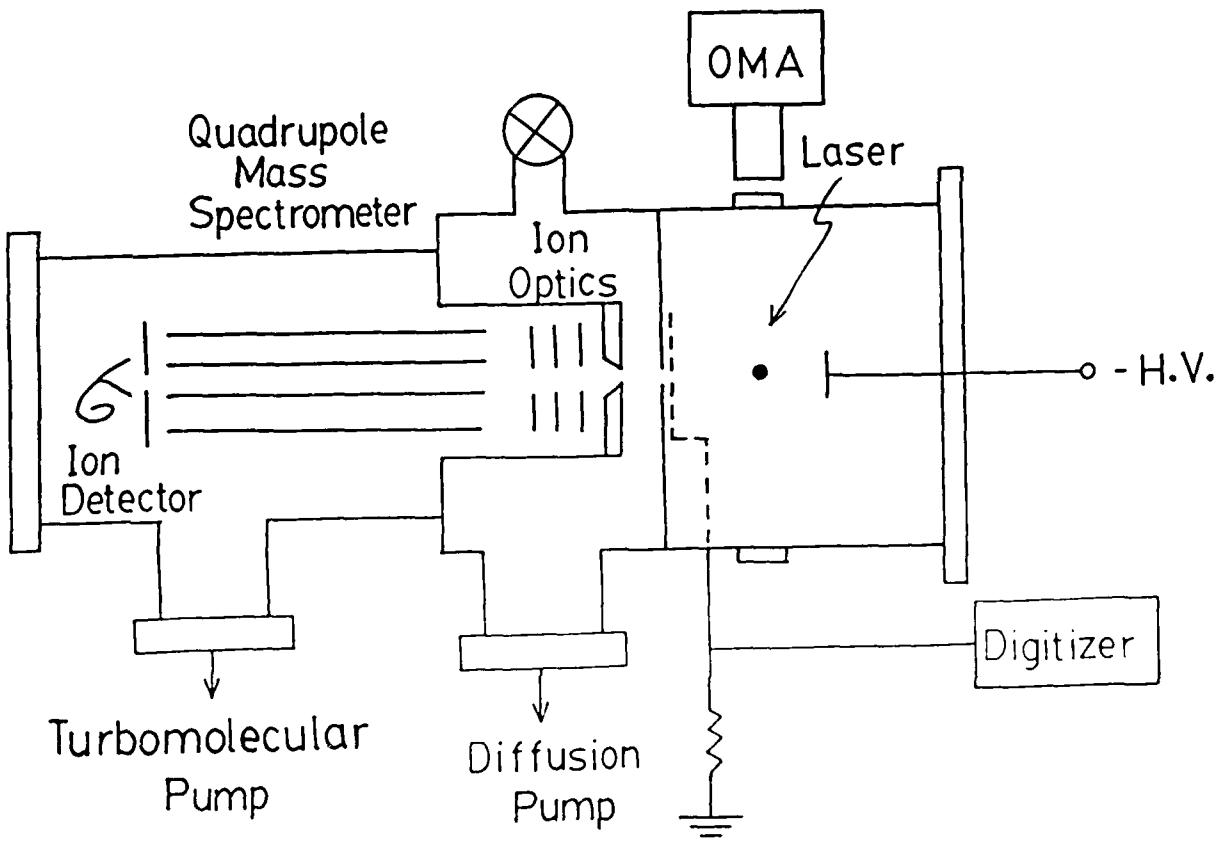


Fig. 1. Schematic diagram for the apparatus constructed
for analyzing the chemical species in discharge
media.

Schedule 1. List of Equipment Purchased

1. C50 Electronics System \$17,640

Manufactured by Extrel Corporation, Pittsburg, PA.

This electron system is used to control the mass spectrometer system.

2. 3/8" Quadruple mass spectrometer with electron multiplier \$11,300

Manufactured by Extrel Corporation, Pittsburg, PA.

This mass spectrometer is used to analyze and to detect ions from electrical discharges.

3. Vacuum Chamber \$ 2,506

Manufactured by Huntington Laboratories, Inc. (Mountain View, CA)

This vacuum chamber is used to house the mass spectrometer and the electrical discharge electrodes.

4. Differential UHV Pumping System \$30,253

Manufactured by Varian Associates, Burlington, MA.

A turbomolecular pump and a diffusion pump are included in this pumping system. This system is used to pump the discharge chamber and the mass spectrometer housing chamber.

5. Power Supply and Ion Gun with Vacuum Flange \$ 9,275

Manufactured by Varian Associates, Mountain View, CA. This equipment is used to sustain and to modify electrical discharges.

6. OMA III System \$20,313

Manufactured by EG & G Princeton Applied Research (Princeton, NJ) with a cost of \$20,313 paid by this grant. The total cost for the entire system was \$51,150.

This system is used to monitor the transient excited species produced from electrical discharges.

7. Excimer Laser with Vacuum Pump \$ 8,278

Manufactured by Lumonics, Inc. (Ontario, Canada) with a cost of \$8,278 paid by this grant. The total cost for this equipment is \$30,200.

This equipment is used to photoexcited molecules, radicals and ions in electrical discharges.

8. Laboratory Table \$ 3,894

Manufactured by Newport Corporation, Newport CA.

This table is used to install Vacuum Chamber and Pump System.

9. Valves, Flanges, Focussing Lens, Electronics \$ 4,541

Manufactured by Melles Griot (\$933), Varian Associates Products (\$2,110), and Tektronics (\$1,498)

These equipment are parts of the apparatus.

